

ENTERED

February 12, 2024

Nathan Ochsner, Clerk

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
GALVESTON DIVISION**

REFINED TECHNOLOGIES, INC.,

Plaintiff.

V.

USA DEBUSK LLC, *et al.*,

Defendants.

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CIVIL ACTION NO. 3:22-cv-00197

OPINION AND ORDER

This case was referred to me for all pre-trial purposes in accordance with 28 U.S.C. § 636. *See* Dkt. 47. Plaintiff Refined Technologies, Inc. (“RTI”) has sued Defendant USA DeBusk LLC (“USAD”) for infringement of United States Patent No. 9,017,488 (“the ’488 Patent”). Pending before me are the Joint Claim Construction and Prehearing Statement (Dkt. 43), Plaintiff’s Opening Claim Construction Brief (Dkt. 46), Defendant’s Responsive Claim Construction Brief (Dkt. 48), Plaintiff’s Reply Claim Construction Brief (Dkt. 50), Defendant’s supplemental briefing (Dkt. 54-1), Plaintiff’s response to Defendant’s supplemental briefing (Dkt. 57), and the parties’ Joint Claim Construction Chart (Dkt. 58-1). I provided preliminary constructions on August 24, 2023 (Dkt. 59), and held a *Markman* hearing on August 30, 2023. *See* Dkt. 61. Having considered the parties’ arguments, briefing, and the relevant case law, I construe the disputed terms of the ’488 Patent as set forth below.

BACKGROUND

The ’488 Patent, titled “Process for Removing Hydrocarbons and Noxious Gasses from Reactors and Media-Packed Equipment,” was filed on July 16, 2014 as patent application serial number 14/333,381 and was published as United States Patent Application Publication US 2014/0326141 A1 on November 6, 2014. The ’488 Patent is a continuation of patent application serial number 13/936,807,

which is a continuation-in-part of application No. 12/478,580, now U.S. Patent No. 8,480,812. The Abstract of the '488 Patent states:

A process for quickly removing hydrocarbon contaminants and noxious gases in a safe and effective manner from catalytic reactors, other media packed process vessels and associated equipment in the vapor phase without using steam. The cleaning agent contains one or more solvents, such as terpenes or other organic solvents. The cleaning agent is injected into contaminated equipment, along with a carrier gas, in the form of a cleaning vapor.

Dkt. 46-1 at 2.

Claim 1 of the '488 Patent is an illustrative claim and recites the following elements, with the disputed terms in bold italics:

1. A method for removing a contaminant from a process system, comprising the steps of:
 - (i) providing a water-free carrier gas source;
 - (ii) providing a non-aqueous solvent source;
 - (iii) ***volatilizing non-aqueous solvent from the non-aqueous solvent source in water-free carrier gas*** from the carrier gas source and ***delivering the carrier gas containing the volatilized non-aqueous solvent to the process system*** and
 - (iv) removing said contaminant out of said system, wherein ***a substantial amount of said contaminant is dissolved in said solvent in a vapor or liquid state as it is being removed from said system.***

Id. at 8 (emphasis added).

Claim 6 of the '488 Patent is an illustrative claim and recites the following: "6. The method of claim 1 wherein the carrier gas is hydrogen." *Id.* No terms in claim 6 are disputed, but I include claim 6 because it is incorporated by reference in claim 7, which is disputed.

Claim 7 of the '488 Patent is an illustrative claim and recites the following, with the disputed terms in bold italics:

7. The method of claim 6 wherein ***said organic contaminant*** comprises at least one member selected from the

group consisting of crude oil and its derivatives, hydrocarbons and noxious gases.

Id. (emphasis added).

Claim 8 of the '488 Patent is an illustrative claim and recites the following, with the disputed terms in bold italics:

8. The method of claim 6, wherein ***said organic contaminant*** is a noxious gas, said noxious gas being at least one member selected from the group consisting of hydrogen sulfide, benzene, carbon monoxide, and a light end hydrocarbon, said light end hydrocarbon being capable of resulting in a positive reading when tested for the Lower Explosive Limit (or "LEL").

Id. (emphasis added).

Claim 10 of the '488 Patent is an illustrative claim and recites the following, with the disputed terms in bold italics:

10. The method of claim 1, wherein the temperature of ***the equipment in the system*** is adjusted to a range of between 225 F and 400 F prior to ***the introduction of the solvent***.

Id. (emphasis added).

LEGAL STANDARD

"[T]he construction of a patent, including terms of art within its claim, is exclusively within the province of the court." *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996).¹ The general legal principles governing the claim construction process are detailed below.

A. CLAIM CONSTRUCTION

"It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (quotation omitted). Thus, "[t]he claim construction inquiry . . . begins and ends in all cases with the actual words of the

¹ Claim construction is a non-dispositive matter appropriately decided by a magistrate judge. *See U.S. Well Servs., LLC v. TOPS Well Servs.*, No. 3:19-cv-00237, 2020 WL 9439469, at *1 n.1 (S.D. Tex. Sept. 18, 2020); *SciCo Tec GmbH v. Boston Sci. Corp.*, 599 F. Supp. 2d 741, 742 (E.D. Tex. 2009).

claim.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). Claim constructions “must . . . accord with the words chosen by the patentee to stake out the boundary of the claimed property.” *Id.* “[T]he words of a claim are generally given their ordinary and customary meaning,” which “is the meaning that the term would have to a person of ordinary skill in the art” (“POSITA”). *Phillips*, 415 F.3d at 1312–13 (quotations omitted).

“A long line of cases indicates that the intrinsic record is the primary source for determining claim meaning.” *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004) (collecting cases). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See id.* “[T]he context in which a term is used in the asserted claim can be highly instructive.” *Phillips*, 415 F.3d at 1314. Other asserted or unasserted claims often aid in determining the claim’s meaning because claim terms are typically used consistently throughout the patent. *See id.* Differences among the claim terms can also assist in understanding a term’s meaning. *See id.* “For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” *Id.* at 1314–15.

“[C]laims ‘must be read in view of the specification, of which they are a part.’” *Id.* at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995)). “[T]he specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Id.* (quotation omitted). “Although the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.” *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quotation omitted). “[I]t is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic

record that the patentee intended the claims to be so limited.” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004).

The prosecution history is another tool for claim construction because, like the specification, the prosecution history “provides evidence of how the [U.S. Patent and Trademark Office (“PTO”)] and the inventor understood the patent.” *Phillips*, 415 F.3d at 1317. “Yet because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes.” *Id.*; see also *Athletic Alts., Inc. v. Prince Mfg.*, 73 F.3d 1573, 1580 (Fed. Cir. 1996) (finding that ambiguous prosecution history may be “unhelpful as an interpretive resource”).

Although extrinsic evidence can also be useful, it is “less significant than the intrinsic record in determining the legally operative meaning of disputed claim language.” *C.R. Bard, Inc.*, 388 F.3d at 862 (quotation omitted). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which a POSITA might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. See *Phillips*, 415 F.3d at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert’s conclusory, unsupported assertions as to a term’s definition are unhelpful. See *id.* Generally, extrinsic evidence is “less reliable than the patent and its prosecution history in determining how to read claim terms.” *Id.*

B. DEPARTING FROM THE ORDINARY MEANING OF A CLAIM TERM

“There are only two exceptions to [the] general rule” that claim terms are construed according to their plain and ordinary meaning: “1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of the claim term either in the specification or during prosecution.” *Golden Bridge Tech., Inc. v. Apple Inc.*, 758 F.3d 1362, 1365 (Fed.

Cir. 2014) (quotation omitted); *see also GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“[T]he specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”). “The standards for finding lexicography or disavowal are exacting.” *GE Lighting Sols.*, 750 F.3d at 1309.

To act as his own lexicographer, the patentee must “clearly set forth a definition of the disputed claim term” and “clearly express an intent to define the term.” *Id.* (quotation omitted). The patentee’s lexicography must appear “with reasonable clarity, deliberateness, and precision.” *Renishaw*, 158 F.3d at 1249 (quotation omitted).

To disavow or disclaim the full scope of a claim term, the patentee’s statements in the specification or prosecution history must amount to a “clear and unmistakable” surrender. *Cordis Corp. v. Bos. Sci. Corp.*, 561 F.3d 1319, 1329 (Fed. Cir. 2009) (quotation omitted); *see also Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1366 (Fed. Cir. 2012) (“The patentee may demonstrate intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.” (quotation omitted)). “Where an applicant’s statements are amenable to multiple reasonable interpretations, they cannot be deemed clear and unmistakable.” *3M Innovative Props. Co. v. Tredegar Corp.*, 725 F.3d 1315, 1326 (Fed. Cir. 2013).

Although a statement of lexicography or disavowal must be exacting and clear, it need not be explicit. *See Trs. of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1364 (Fed. Cir. 2016) (“[A] patent applicant need not expressly state ‘my invention does not include X’ to indicate his exclusion of X from the scope of his patent.”). Lexicography or disavowal can be implied where, for example, the patentee makes clear statements characterizing the scope and purpose of the invention. *See On Demand Mach. Corp. v. Ingram Indus., Inc.*, 442 F.3d 1331, 1340 (Fed. Cir. 2006) (“[W]hen the scope of the invention is clearly stated in the

specification, and is described as the advantage and distinction of the invention, it is not necessary to disavow explicitly a different scope.”). Even so, the plain meaning governs “[a]bsent implied or explicit lexicography or disavowal.” *Trs. of Columbia Univ.*, 811 F.3d at 1364 n.2.

C. DEFINITENESS UNDER 35 U.S.C. § 112, ¶ 2

Patent claims must particularly point out and distinctly claim the subject matter regarded as the invention. *See* 35 U.S.C. § 112, ¶ 2. A claim, when viewed in light of the intrinsic evidence, must “inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). If it does not, the claim fails § 112, ¶ 2 and is invalid as indefinite. *See id.* at 901. “[I]ndefiniteness is a question of law and in effect part of claim construction.” *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517 (Fed. Cir. 2012). Whether a claim is indefinite is determined from the perspective of a POSITA at the time of filing the application. *See Nautilus Inc.*, 572 U.S. at 911. “Indefiniteness must be proven by clear and convincing evidence.” *Sonix Tech. Co. v. Publ’ns Int’l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

TERMS NO LONGER REQUIRING CONSTRUCTION

The parties originally disputed whether the terms “process system” and “a substantial amount” require construction. “With respect to the ‘process system,’ USAD agrees that the Court need not construe the term at this time, but reserves the right to seek a construction should RTI advance infringement or validity positions that reveal a dispute.” Dkt. 48 at 24. With regard to “a substantial amount,” the parties agree that “a substantial amount” means “at least 50%.” *See* Dkt. 61 at 65 (RTI counsel’s stating “we don’t see any real problems with the Court’s construction [of ‘a substantial amount’ meaning ‘at least 50%’]”); *see also* Dkt. 48 at 29 (USAD conceding that “‘a substantial amount’ means ‘at least 50%’”). Accordingly, I need not construe “process system” or “a substantial amount.”

CONSTRUCTION OF DISPUTED TERMS

The parties' dispute focuses on the meaning and scope of eight terms/phrases in the '488 Patent.

1. “volatilizing” or “volatilized” (claim 1, 9:42, 45²)

<u>Disputed Terms</u>	<u>RTI's Construction</u>	<u>USAD's Construction</u>
“volatilizing” and “volatilized”	Ordinary and customary meaning.	<p>“converting a substance from a liquid phase to a vapor phase by applying heat, by reducing pressure, or both sufficient to bring the substance to its boiling point”</p> <p>“a substance that has been converted from a liquid phase to a vapor phase by applying heat, by reducing pressure, or both sufficient to bring the substance to its boiling point”</p> <p>Indefinite if “ordinary and customary meaning” is applied.</p>

The parties agree that the ordinary and customary meaning of “volatilizing” or “volatilized” encompasses “converting a substance from a liquid phase to a vapor phase, which could occur through boiling or through evaporation below the boiling point.” Dkt. 48 at 12. Yet, USAD contends “the totality of the prosecution history provides clear evidence that RTI intentionally limited ‘volatilizing’/‘volatilized’ to mean *fully vaporized*, which requires conditions at or above the solvent’s boiling point.” *Id.* at 21 (emphasis added). RTI retorts that USAD has improperly framed the dispute as “the degree of vaporization . . . , [whereas] here the parties’ dispute is about the ***mechanism*** of vaporization.” Dkt. 50 at 7. RTI also contends there is not exacting evidence in the prosecution history that it disavowed the ordinary and customary meaning of “volatilized.”

² Citations in this format are to the columns and lines of the '488 Patent (Dkt. 46-1).

“The claim construction inquiry . . . begins and ends in all cases with the actual words of the claim.” *Renishaw PLC*, 158 F.3d at 1248. “[T]he words of a claim are generally given their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312 (quotation omitted). The parties agree that the ordinary and customary meaning of “volatilizing” or “volatilized” includes both evaporation and boiling. “[T]he specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.” *GE Lighting Sols.*, 750 F.3d at 1309. USAD does not contend that RTI has acted as a lexicographer. Thus, the only question I must answer is whether there is “clear and unmistakable” evidence that RTI intended to surrender a claim to volatilization through evaporation. *Cordis Corp.*, 561 F.3d at 1329. I find that there is not.

USAD cannot point to a single statement that serves as exacting evidence that RTI disavowed the ordinary and customary meaning of “volatilized.” Rather, USAD points to the “totality” of the prosecution history. Essentially, USAD’s argument is that, to distinguish itself from the prior art (Foutsitzis), “RTI has consistently emphasized that its claimed cleaning process uses solvent in vapor form, while Foutsitzis’ [toluene] solvent is in liquid form because it is below the boiling point.” Dkt. 48 at 17. USAD reasons that because “a solvent inherently will exist in both vapor and liquid form [below its boiling point,]” the solvent used in Foutsitzis would necessarily evaporate “to some degree,” and therefore, according to USAD, RTI’s solvent must be used *above* its boiling point to distinguish the ’488 Patent from Foutsitzis. *Id.* at 18.

I agree with USAD that it is legally permissible to consider the prosecution history in totality, and I follow USAD’s logic. But the standard for disavowal is “clear and unmistakable” surrender. *Cordis Corp.*, 561 F.3d at 1329. It is unlikely that RTI meant to limit the ordinary and customary meaning of “volatilizing” and “volatilized” by simply referring to toluene’s boiling point in the prosecution history. More likely, RTI emphasized toluene’s boiling point to establish merely that Foutsitzis discloses delivery of a liquid solvent, whereas the ’488 Patent

discloses that “the solvent is delivered to the system as a vapor.” Dkt. 48 at 14 (quotation omitted); *see also* Dkt. 46-1 at 9:44–46 (“delivering the carrier gas containing the volatilized non-aqueous solvent to the process system”); Dkt. 46-8 at 15 n.4 (“We agree with [RTI] that the solvent in Foutsitzis Example II—toluene at 65° C.—is a liquid. . . . Toluene has a boiling point of 110.6° C. . . . Our finding that Example II uses a liquid solvent is consistent with Foutsitzis’s disclosure that the solvent (toluene) was circulated by ‘the charged pump,’ while nitrogen was recirculated with ‘the recycle compressors.’”).

There is simply not enough evidence before me to conclude that RTI clearly and unmistakably meant to limit the meaning of “volatilizing” or “volatilized.” I will not import such a limitation to the plain and ordinary meaning of these terms. “Volatilizing” and “volatilized” are construed according to their ordinary and customary meaning—“to convert a substance from a liquid phase to a vapor phase.” This conversion can occur through evaporation or boiling—the terms are commonly understood to encompass either method and are not used in any specialized way in the specification or claims of the ’488 Patent.

USAD argues that “[l]eft undefined, terms such as ‘volatilizing’ are indefinite” because the “‘ordinary meaning’ approach to claim construction leaves the resolution of the fundamental claim scope dispute between the parties to the jury.” Dkt. 48 at 8. USAD also contends that “if we go with the plain and ordinary meaning of ‘volatilizing,’ Foutsitzis’s method would fit within [claim 1 of the ’488 Patent].” Dkt. 61 at 33. I disagree. Foutsitzis does not disclose delivery of a volatilized solvent. I am confident that just as a jury understands that a glass of water is a liquid—despite the water’s surface necessarily (albeit imperceptibly) evaporating to some degree—the jury will understand that the ’488 Patent discloses the introduction of a vapor-phase solvent, not a liquid-phase solvent. How the solvent is vaporized is irrelevant—what matters is that the solvent is delivered to the system as a vapor. Of course, that implicates the remaining elements of claim 1, which are also disputed.

2. “volatilizing non-aqueous solvent from the non-aqueous solvent source in water-free carrier gas” (claim 1, 9:42–43)

<u>Disputed Terms</u>	<u>RTI’s Construction</u>	<u>USAD’s Construction</u>
“volatilizing non-aqueous solvent from the non-aqueous solvent source in water-free carrier gas”	Ordinary and customary meaning.	<p>“converting all or almost all of the non-aqueous solvent provided from the non-aqueous solvent source to the vapor phase through contact with water-free carrier gas that is at a temperature and/or pressure sufficient to bring the nonaqueous solvent to its boiling point”</p> <p>Indefinite if “ordinary and customary meaning” is applied.</p>

USAD argues that “when a substance is at its boiling point, all or almost all of it is going to be in the vapor phase,” therefore I should “clarif[y] that ‘all or almost all’ of the solvent must be converted to the vapor phase.” Dkt. 48 at 23 (quotation omitted). But this argument assumes I construed “volatilizing” and “volatilized” differently than their ordinary and customary meaning by importing a boiling point limitation, which I did not. Yet, USAD argues this term must be construed because even RTI’s expert, Mr. Livingston, conceded “that there must be enough volatilization of the solvent in order to . . . remove a substantial amount of the contaminants.” *Id.* at 23. Far from supporting USAD’s argument, however, Mr. Livingston’s testimony demonstrates why this term need not be construed differently than its ordinary and customary meaning. It is self-evident to a POSITA that “enough solvent must be vaporized to effect the remaining steps of the claim” (Dkt. 46-4 at 17), because the ’488 Patent discloses delivery of a vapor-phase solvent, not a liquid-phase solvent. Again, some degree of evaporation from the surface of a liquid and some degree of condensation from a vapor will not prevent a POSITA (or a juror) from distinguishing between a liquid and a vapor. Thus, these terms need not be construed differently than their ordinary and customary meaning, and are not indefinite.

3. “delivering the carrier gas containing the volatilized non-aqueous solvent to the process system” (claim 1, 9:44–46)

<u>Disputed Terms</u>	<u>RTI’s Construction</u>	<u>USAD’s Construction</u>
“delivering the carrier gas containing the volatilized non-aqueous solvent to the process system”	Ordinary and customary meaning.	“introducing the carrier gas volatilized non-aqueous solvent mixture into the system containing the contaminant”

Here, USAD contends that “delivering to” actually means “introducing into,” which would have the effect of requiring “that the solvent is volatilized in the carrier gas **before** the volatilized solvent-carrier gas mixture is delivered to (i.e., introduced into) the process system.” Dkt. 48 at 25. USAD argues:

This understanding of the claim language was confirmed by both RTI and the [Patent Trial and Appeal Board (“PTAB”)] during the IPR. There, RTI stated:

Foutsitzis does not disclose a carrier gas-*volatilized* solvent mixture, much less delivery of that mixture to a process system.

Ex. 10 at p. 12 (emphasis in original). The PTAB agreed:

Foutsitzis discloses that “inert gases are circulated along with the solvent to improve contact between solvent and equipment,” **but does not disclose that the solvent is volatilized before it is delivered to the system.**

Ex. 12 at 14 (internal citation omitted) (emphasis added). The PTAB’s statement is consistent with USAD’s proposed construction. That is, “volatilized **before** it is delivered to” shows that the PTAB understood from RTI that claim 1 requires the solvent to be volatilized in the carrier gas before the mixture is **introduced into** the system.

Dkt. 48 at 25. But neither RTI nor the PTAB used the words “introduced into.” Rather, USAD has read “introduced into” in place of “delivered to” in both of the statements quoted above. Simply substituting one word for another is not a valid argument. Moreover, despite USAD’s emphasis of the word “before,” the prosecution history shows that the most important word in the PTAB’s statement

quoted above was not “before,” but “volatilized,” as Foutsitzis did not disclose cleaning with a volatilized solvent.

USAD next argues that “delivering to” must mean “introducing into” because “the specification describes alternative delivery methods.” *Id.* Specifically,

In the first method, the solvent is injected into the carrier gas, and the “**mixture is in turn introduced into** the equipment to clean its internal surfaces.” Ex. 1 at 4:40-44. . . . In an alternative method for shutdown equipment, the flow of carrier gas inside the equipment is used “to **distribute the cleaning agents throughout** the equipment to clean its internal surfaces.” *Id.* at 4:44-49. These descriptions of **alternative** delivery methods—one where the gas and solvent are mixed and then the mixture is introduced “into” an online or offline system, and another where the solvent is distributed by a carrier gas “throughout” an offline system—supports the conclusion that “delivering to” has a specific meaning—i.e., “introducing into.”

. . . RTI chose to use the term “to” in claim 1. Thus, while RTI may have described alternative delivery methods—a first where the gas-volatilized solvent mixture is delivered to the system and a second where the solvent is distributed throughout the system by the carrier gas—RTI’s choice to use “to” in claim 1 strongly confirms that RTI did not intend claim 1 to cover all delivery methods.

Dkt. 48 at 25–27. But “[a] claim construction that excludes the preferred embodiment is rarely, if ever, correct and would require highly persuasive evidentiary support.” *SynQor, Inc. v. Artesyn Techs., Inc.*, 709 F.3d 1365, 1378–79 (Fed. Cir. 2013) (quotation omitted). The simpler construction, as RTI points out, is that “[d]elivering to’ includes introducing vaporized solvent into the system as well as delivering it to any part of the system.” Dkt. 50 at 14.

Finally, USAD contends that the prosecution history demonstrates “that RTI’s choice of ‘to’ in claim 1 not only was deliberate, but necessary to avoid the prior art.” Dkt. 48 at 27.

[T]he Examiner rejected original claim 1 on the basis that “Foutsitzis ... disclose[s] a method for removing contaminants from a process system by circulating inert gases along with non-aqueous solvent **through** the system.” Ex. 15 at p. 3 (R-T-I_00000357). In response, RTI amended claim 1 and stated:

Claim 1 has been amended to recite that the non-aqueous solvent is volatilized in the carrier gas and delivered **to** the process system in that form.

Ex. 8 at p. 5 (R-T-I_00000341). RTI further elaborated:

Claim 1, as amended, **requires** that the solvent is **introduced** in a volatilized form in the carrier gas – i.e., the carrier gas and the non-aqueous solvent are concurrently within the process system.

Id. at p. 6 (R-T-I_00000342). This is the same language RTI used in the specification to describe one of the delivery methods, but not the other. If RTI had wanted to capture both delivery methods, RTI could have used the phrase “to or through,” as it did in the specification. It could have used the phrase “distribute throughout,” as it did in the specification. Or, it could have used “circulated through,” as it did in dependent claim 9 (“the carrier gas containing the volatilized solvent is **circulated through** the system using a compressor”). With many different linguistic models to choose from, RTI chose “delivered **to** the process system” and emphasized that this language distinguished claim 1 from Foutsitzis’ method of circulating a gas/solvent mixture “**through** the system.”

Dkt. 48 at 27. If any of the above-quoted emphases had actually appeared in the originals, I might be convinced that the examiner and RTI were truly concerned about prepositions. But USAD conveniently omits that *USAD* itself added all of the above-quoted emphases. Again, the simpler explanation is that the introduction of “volatilized” is what permitted RTI to distinguish the ’488 Patent from the prior art, not a change in prepositional phrases. *See* Dkt. 48-9 at 5 (“None of the prior art discloses or suggests a process of removing contaminants from a process system by volatilizing non-aqueous solvent with water free carrier gas.”); *id.* (remarking that “the step of the non-aqueous solvent [being] volatilized with the carrier gas and delivered to the process system in volatilized form” is “different” from Foutsitzis); *id.* (remarking that the solvent in another prior art, Gomi, “is not volatilized”). Or, as RTI puts it, “the issue before the PTAB was never about **when** the solvent was vaporized, but about whether it **was** vaporized.” Dkt. 50 at 15.

In sum, I cannot find clear and unmistakable evidence that RTI redefined “delivering to” to mean “introducing into,” or disavowed delivery through the

process system, as well as introduction to the process system. Thus, I decline to depart from the ordinary and customary meaning of “delivering to” by substituting it with “introducing into.”

4. **“said contaminant is dissolved in said solvent in a vapor or liquid state as it is being removed from said system” (claim 1, 9:48–50)**

<u>Disputed Terms</u>	<u>RTI’s Construction</u>	<u>USAD’s Construction</u>
“said contaminant is dissolved in said solvent in a vapor or liquid state as it is being removed from said system”	“[said contaminant] (in either the solid, vapor or liquid phase) is mixed with the solvent (in either vapor or liquid phase) [as it is being removed from the system]”	Indefinite

The disputed terms must first be read in the context of claim 1 as a whole. For ease of reading, I have emphasized the disputed terms and their antecedent bases:

1. A method for removing **a contaminant** from a process system, comprising the steps of:
 - (i) providing a water-free carrier gas source;
 - (ii) providing a non-aqueous solvent source;
 - (iii) volatilizing non-aqueous solvent from the non-aqueous solvent source in water-free carrier gas from the carrier gas source and delivering the carrier gas containing **the volatilized non-aqueous solvent** to the process system and
 - (iv) removing **said contaminant** out of said system, wherein a substantial amount of **said contaminant is dissolved in said solvent in a vapor or liquid state as it is being removed from said system.**

Dkt. 46-1 at 8 (emphasis added). USAD contends that “as it is being removed from said system” and “in a vapor or liquid state” render element (iv) indefinite. RTI disagrees, of course. RTI did not even address “as it is being removed from said system” in its opening brief, thinking the parties’ dispute centered on “dissolved.”

As for “in a vapor or liquid state,” RTI contends that phrase refers to the solvent. I will address each phrase in turn.

(a) **“as it is being removed from said system”**

USAD recognizes that

[l]ogically, [the] “it” that is being removed in the “wherein” clause would seem to refer to “said contaminant” that is being removed in the first clause. This conclusion is strongly supported by the preamble of claim 1, which refers to a “method for removing a contaminant from a process system. That is, claim 1 is written in a manner that reasonably suggests that the antecedent for “it is being removed” is “said contaminant” that is being removed.

Dkt. 48 at 29. I agree, which is why I remarked in my Proposed Claim Constructions that “said contaminant” is the direct object to which the predicate “removed” refers. *See* Dkt. 59 at 2. Yet, USAD contends that because RTI later argued during litigation that “it” refers to removal of the solvent, “it” is ambiguous. According to USAD, “it cannot be both.” Dkt. 48 at 30. RTI retorts that “whether ‘it’ refers to the solvent or the contaminant does not affect the claim scope” is irrelevant because “**both** [the contaminant and the solvent] are necessarily removed from the system **together**” after “the contaminant is dissolved in the solvent.” Dkt. 50 at 17. Because the parties do not dispute the broader meaning of dissolved, I agree with RTI. It really makes no difference whether “it” refers to just the contaminant, or the contaminant-solvent solution. Either way, the contaminant is being removed from the system, which, as USAD has already acknowledged, is what claim 1 is about. *See* Dkt 48 at 29. Thus, as a matter of law and plain English, “it” refers to “said contaminant,” and is not indefinite.

(b) **“in a vapor or liquid state”**

USAD does not propose a construction for “in a vapor or liquid state,” although it suggests “this phrase could be tethered to the ‘substantial amount of said contaminant’ that is dissolved in the solvent.” Dkt. 48 at 31. RTI contends that “neither the claim nor the specification limits ‘contaminants’ to a particular phase,” and that “in a vapor or liquid state” refers to “the previously referenced volatilized

solvent” that was volatilized at delivery, but does not necessarily remain volatilized. Dkt. 46 at 25–27. USAD’s indefiniteness argument rests upon what USAD contends are contradictory positions that RTI took during prosecution. Specifically, USAD points to the inconsistency between RTI’s proposed definition now, and this statement to the PTAB:

B. All Claims: “(iv) removing said contaminant out of said system, wherein a substantial amount of said contaminant is dissolved in said solvent in a vapor or liquid state as it is being removed from said system”

Petitioner alleges that Foutsitzis teaches this element because it discloses that contaminants purged from the conversion system can be removed from a liquid organic solvent via distillation. Petition at 26. That is not what this element requires. Element (iv) requires removal of liquid or vapor contaminants dissolved in “said solvent,” which by antecedent basis to element (iii) is the delivered *volatilized* solvent (not a liquid solvent). Petitioner has failed to show the element (iv) removal process is in the art, and thus its Petition should be denied.

Dkt. 48-10 at 20. USAD contends “RTI’s current position is entirely inconsistent with the position RTI took before the PTAB where RTI unequivocally represented that element (iv) required the solvent to be in the vapor phase and not the liquid phase.” Dkt. 48-2 at 20. I do not see the inconsistency.

When RTI referred to the solvent as “the delivered *volatilized* solvent (not a liquid solvent),” RTI was talking about the phase of the solvent delivered to the process system from the antecedent element (iii). But as Mr. Livingston has explained, “the claim language stating that the contaminant is dissolved in the solvent ‘in a vapor or liquid state’ . . . indicates to a POSITA that the solvent may be either a vapor or a liquid.” Dkt. 46-4 at 57. This makes sense to me. The dispute in the prosecution history centered on the phase of the **delivered** solvent—not how the solvent might have changed phase (either through evaporation or condensation) once in the system. *See* Dkt. 50 at 18 (“There is nothing inconsistent between RTI’s argument to the PTAB and its briefing here. At the PTAB, RTI

argued that Foutsitzis never disclosed a solvent that was vaporized. . . . Thus, no matter the phase at removal, Foutsitzis didn't teach the claim."). This construction—in which "in a vapor or liquid state" refers to "said solvent"—also tracks with the ordinary operation of the English language, in which prepositional phrases (here, "in a vapor or liquid state") typically refer to the immediately preceding noun (here, "said solvent").

As for "said contaminant," according to RTI's expert—and anyone who has passed third-grade science—"a solute . . . can be any standard phase, i.e., a solid, liquid, or gas." Dkt. 46-4 at 23. I agree with RTI that neither the specification nor the claim limit the contaminant's phase at dissolution. Moreover, the parties appear to have disputed the contaminant's phase only because USAD argued there was confusion as to whether "in a vapor or liquid state" referred to "said contaminant" or "said solvent." See Dkt. 48-2 at 20 (discussing three possible interpretations of "in a vapor or liquid state"). USAD's expert never discussed the word "solid" in his report, and the word "solid" was not mentioned once during the *Markman* hearing. Other than pointing out that "[t]he specification . . . does not describe dissolving contaminants in the solid phase," and that "[n]o mention was made of **solid** contaminants" before the PTAB (Dkt. 48 at 31 & n.3), USAD offers nothing that comes close to clear and unmistakable evidence that RTI intended to disavow the ordinary and customary understanding that solutes—like the contaminants contemplated in '488 Patent—can exist in all three phases (solid, liquid, or gas). In other words, it does not seem that the phase of the contaminant is actually relevant. Because I conclude that "in a vapor or liquid state" refers to "said solvent," and because there is no evidence that RTI intended to limit the phase of "said contaminant," I see no need to depart from the ordinary and customary meaning of "said contaminant," which contemplates all three phases.

In sum, "said contaminant is dissolved in said solvent in a vapor or liquid state as it is being removed from said system" means exactly what it says: "said contaminant is dissolved in said solvent in a vapor or liquid state as said

contaminant is being removed from said system.” Because “a POSITA would understand this portion of the claim to encompass a contaminant of any phase (solid, liquid, or vapor phase contaminants) dissolved in a liquid solvent . . . [or] a vapor phase solvent” (Dkt. 46-4 at 23), this phrase is not indefinite.

5. “said organic contaminant” (claim 7, 10:9; claim 8, 10:13–14)

<u>Disputed Terms</u>	<u>RTI’s Construction</u>	<u>USAD’s Construction</u>
“said organic contaminant”	Not indefinite (refers to claim 1 contaminant)	Indefinite

The terms “said organic contaminant” are used in both claims 7 and 8, so I will discuss them together. But first, a review of the terms in context:

6. The method of claim 1 wherein the carrier gas is hydrogen.

7. The method of claim 6 wherein **said organic contaminant** comprises at least one member selected from the group consisting of crude oil and its derivatives, hydrocarbons and noxious gases.

8. The method of claim 6, wherein **said organic contaminant** is a noxious gas, said noxious gas being at least one member selected from the group consisting of hydrogen sulfide, benzene, carbon monoxide, and a light end hydrocarbon, said light end hydrocarbon being capable of resulting in a positive reading when tested for the Lower Explosive Limit (or “LEL”).

Dkt. 46-1 at 8 (emphasis added). USAD contends both instances of “said organic contaminant” lack an antecedent basis because claim 1 references only a “contaminant,” not an “organic contaminant.” Additionally, USAD highlights that “organic contaminant” “is used inconsistently with its commonly understood meaning and inconsistently between claims 7 and 8.” Dkt. 48 at 33. Everyone agrees that hydrocarbons are organic (meaning they contain at least one carbon atom), but “not all noxious gases, including the noxious gases described in the ’488 Patent, are organic.” *Id.* Specifically, hydrogen sulfide is not organic because it does not contain a carbon atom. *See* Dkt. 46-4 at 27. USAD argues that “a POSITA would understand that the category of noxious gases [in claim 7] is limited to **organic** noxious gases,” but that a POSITA would be confused by the fact that, in

“claim 8, ‘said organic contaminant’ is defined as a noxious gas, and a noxious gas further is limited to a group whose members are organic and inorganic.” Dkt. 48 at 33–34.

I agree with USAD that there is no antecedent basis for “organic” and the word “organic” is being used in a manner that would horrify any chemistry teacher. Even so, RTI has listed the exact contaminants to which it is referring: “at least one member selected from the group consisting of hydrogen sulfide, benzene, carbon monoxide, and a light end hydrocarbon, said light end hydrocarbon being capable of resulting in a positive reading when tested for the Lower Explosive Limit (or ‘LEL’).” Dkt. 46-1 at 8, 10:15–20. “[A] term can be defined only in a way that comports with the instrument as a whole.” *Markman*, 517 U.S. at 389. Accordingly, claims 7 and 8 must be read together. Because claim 8 “lists exactly which contaminants qualify as the ‘organic contaminant’ referenced in the claim,” “a POSITA would understand that the claim intends to encompass hydrogen sulfide (and the other listed components),” even though hydrogen sulfide is inorganic. Dkt. 46-4 at 60. In other words, despite the scientifically incorrect drafting and seemingly superfluous use of “organic,” the explicit list of components eliminates any confusion as to what contaminants are included in the claims. Thus, these terms are not indefinite.

**6. “the equipment in the system”/“the introduction of the solvent”
(claim 10, 10:24–25)**

<u>Disputed Terms</u>	<u>RTI’s Construction</u>	<u>USAD’s Construction</u>
“the equipment in the system”/“the introduction of the solvent”	Not indefinite	Indefinite

Claim 10 states: “The method of claim 1, wherein the temperature of the equipment in the system is adjusted to a range of between 225 F and 400 F prior to the introduction of the solvent.” Dkt. 48 at 34. USAD contends the terms “equipment in the system” and “the introduction of the solvent” “both lack

antecedent basis in any other claim”; “[n]or can an antecedent basis be implied with reasonable certainty”; and that the claim language is “ambiguous.” *Id.* Here is part of USAD’s explanation of why it believes “equipment in the system” is indefinite:

The uncertainty stems from the inconsistent use of ambiguous claim language. Claim 1 refers to “**a** process system” and then “**said** system” is used twice, suggesting that “a process system” provides the antecedent for “said system” in claim 1. Ex. 1, Claim 1. Claims 2 and 3 refer to “**the** process system,” suggesting that “a process system” in claim 1 is the antecedent. Ex. 1, Claims 2-3. However, claim 10’s reference to “the equipment in **the** system” (not “said system” and not “the process system”) follows neither of these claiming conventions. This poor claim drafting creates ambiguity as to whether “the system” in claim 10 is the process system in claim 1 or something else.

Id. at 34–35. So to recap, USAD understands that “a process system” is the antecedent basis for both “said system” and “the process system,” but it simply cannot see how “a process system” is also the antecedent basis for “the system.” Poppycock. There is no ambiguity: “the system” in claim 10 is the process system in claim 1 because there is nothing else it could be. USAD’s own expert acknowledges that such a reading is reasonable. *See* Dkt. 46-7 at 53.

Yet, USAD continues feigning confusion:

The specification does not help as it also provides multiple different options for “the system,” none of which is reasonably certain to a POSITA. For example, the specification discloses that the “**equipment** used to introduce the carrier gas may include a heater to bring the gas to the appropriate temperature prior to injecting the chemical solvent(s). Preferably, the appropriate temperature is in the range from about 225° F. to about 400° F.” Ex. 1 at 5:4-8. The specification also states that the “**equipment** used to introduce the cleaning agent may include a system of pumps, pipe fittings and, optionally, nozzles to vaporize and accurately control the volumetric ratios of chemical vapor and carrier gas.” *Id.* at 4:59-63. Another passages [sic] states that “the method may include a further step of bringing the vessel or system of **equipment** within the proper temperature range by either heating it or cooling it prior to the introduction of the solvent.” *Id.* at 4:28-32. In view of this description, a POSITA would not understand with reasonable certainty whether

“the equipment in the system” is the equipment in the process system, the equipment in another system that heats the carrier gas prior to injecting the solvent, or the equipment in yet another system that is used to introduce the solvent. Ex. 2 at ¶ 84.

Dkt. 48 at 35. I am not buying it. Again, “the system” in claim 10 is the process system in claim 1. “Thus, no matter what equipment is referenced in the specification, a POSITA would have understood, with reasonable certainty, that the system of claim 10 refers to the process system, and the solvent is introduced into that system.” Dkt. 50 at 19; *see also* Dkt. 46-4 at 61 (“[T]he process system refers not only to an overall system, but includes ‘some or all’ individual pieces of equipment within that system. This is clear from the patent specification.”).

But USAD makes one final pass at generating ambiguity:

The uncertainty as to claim 10’s scope is amplified by claim 10’s reference to “the introduction of the solvent,” which also lacks an antecedent in any other claim. Claim 10 does not specify what the solvent is introduced into, and multiple options again exist so that, overall, the scope of the claim cannot be determined with reasonable certainty. For example, does claim 10 require introduction of the solvent into the equipment that is being heated, in the carrier gas, or somewhere else?

Dkt. 48 at 36. USAD’s “‘unanswered questions’ . . . [are] not the correct standard for evaluating whether the claim[meets] the standard for definiteness. The claims set forth the metes and bounds of the invention; they are not intended to repeat the detailed operation of the method as described in the specification.” *Nature Simulation Sys. Inc. v. Autodesk, Inc.*, 50 F.4th 1358, 1366 (Fed. Cir. 2022). It is self-evident that “[a] method for removing a contaminant from a process system” will at some point require introduction of the solvent into the process system. Dkt. 46-1 at 8, 9:38–39; *see also* Dkt. 46-4 at 61–62 (“[W]hile claim 1 does not explicitly reference this initial introduction of the solvent into the process system, it is a necessary, implicit step because a POSITA would understand that the solvent necessarily has to be brought into the system for the first time at some starting point.”). Thus, claim 10 is not indefinite.

CONCLUSION

For the reasons discussed above, the disputed terms will be construed as set forth in Appendix A.

SIGNED this 12th day of February 2024.

A handwritten signature in black ink, consisting of a large, sweeping loop followed by a series of smaller, connected strokes that end in a horizontal line.

ANDREW M. EDISON
UNITED STATES MAGISTRATE JUDGE

APPENDIX A

<u>Disputed Terms</u>	<u>The Court's Construction</u>
“volatilizing” and “volatilized” claim 1, 9:42, 45	Ordinary and customary meaning. Not indefinite.
“volatilizing non-aqueous solvent from the non-aqueous solvent source in water-free carrier gas” claim 1, 9:42–43	Ordinary and customary meaning. Not indefinite.
“delivering the carrier gas containing the volatilized non-aqueous solvent to the process system” claim 1, 9:44–46	Ordinary and customary meaning.
“said contaminant is dissolved in said solvent in a vapor or liquid state as it is being removed from said system” claim 1, 9:48–50	“said contaminant is dissolved in said solvent (in a vapor or liquid state) as said contaminant is being removed from said system” Not indefinite.
“said organic contaminant” claim 7, 10:9; claim 8 10:13–14	Not indefinite.
“the equipment in the system” claim 10, 10:24	Not indefinite.
“the introduction of the solvent” claim 10, 10:25	Not indefinite.